



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,032	10/31/2003	Dong-Bock Lee	SEC.1043	1092
20987	7590	02/23/2006	EXAMINER	
VOLENTINE FRANCOS, & WHITT PLLC ONE FREEDOM SQUARE 11951 FREEDOM DRIVE SUITE 1260 RESTON, VA 20190			ALEJANDRO MULERO, LUZ L	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/697,032

Applicant(s)

LEE, DONG-BOCK

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hama et al., U.S. Patent 5,792,261 in view of Aruga, U.S. Patent 5,779,848.

Hama et al. shows the invention as claimed including a chamber structure of an inductive coupling plasma etching apparatus (see col. 13-lines 49-56), comprising: an etch chamber 16 in which an etching process is performed; a plasma chamber 18 in which plasma is generated; and a segregation wall part 14 having a portion made of quartz ceramic material opposite to the etch chamber that is a ceiling wall of the etch chamber, and having a portion made of quartz material opposite to the plasma chamber that is a bottom wall of the upper chamber, the segregation wall part separating the etch chamber from the plasma chamber (see fig. 1 and col. 3-line 61 to col. 7-line 23).

Hama et al. is applied as above but fails to expressly disclose the segregation wall part having a portion made of a non-quartz ceramic opposite to the etch chamber and the chamber being of cylindrical shape. Aruga discloses covering a quartz window with an aluminum nitride ceramic in order to protect the window from damage due to plasma (see abstract and fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made

to modify the apparatus of Hama et al. so as to have the portion of the segregation wall part opposite to the etch chamber of a non-quartz ceramic because this will adequately protect the segregation wall part from the plasma.

With respect to the particular shape of the chamber, a prima facie case of obviousness exists because the particular shape of the chamber would not render patentability to the claimed invention absent persuasive evidence that the claimed shape is significant.

Concerning claim 2, note that the plasma chamber is an upper portion of the chamber structure and the etch chamber is the lower portion of the chamber structure.

Claims 4, 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hama et al., U.S. Patent 5,792,261 in view of Aruga, U.S. Patent 5,779,848 as applied to claims 1-3, 6, and 9-11 above, and further in view of Li et al., U.S. Patent 6,009,830.

Hama et al. and Aruga are applied as above but fails to expressly disclose wherein the portion of the segregation wall part opposite to the etch chamber includes a heater that heats the ceramic material. Li et al. discloses an inductively coupled apparatus including a coil 24 and a heating element 28 enclosing the coil so as to heat the chamber surfaces (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Hama et al. modified by Aruga so as to include a heater in

the segregation wall part because such a heater will allow better controllability of the process being conducted within the apparatus.

Claims 5, 8, 13-14, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hama et al., U.S. Patent 5,792,261 in view of Aruga, U.S. Patent 5,779,848 as applied to claims 1-3, 6, and 9-11 above, and further in view of Yin et al., U.S. Patent 6,352,049.

Hama et al. and Aruga are applied as above but do not expressly disclose wherein the segregation wall part includes gas flow paths and gas exhaust holes that supply process gas into the etch chamber.

Yin et al. discloses a segregation wall part 304 including gas flow paths and gas exhaust paths that supply process gas into the etch chamber which is made of ceramic material opposite to the etch chamber, the segregation wall part separating the etch chamber from the plasma chamber (see fig. 6 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Hama et al. modified by Aruga so as to include the gas flow paths in the segregation wall part as disclosed by Yin et al. because this is a suitable alternative to provide gas flow into the etch chamber.

Concerning claims 14, 16, and 18, note that the apparatus of Hama et al. modified by Aruga and Yin et al. will disclose the claimed limitations.

Claims 15, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hama et al., U.S. Patent 5,792,261 in view of Aruga, U.S. Patent 5,779,848 and Yin et al., U.S. Patent 6,352,049 as applied to claims 5, 8, 13-14, 16, and 18 above, and further in view of Li et al., U.S. Patent 6,009,830.

Hama et al., Aruga, and Yin et al. are applied as above but fail to expressly disclose wherein the portion of the segregation wall part opposite to the etch chamber includes a heater that heats the ceramic material. Li et al. discloses an inductively coupled apparatus including a coil 24 and a heating element 28 enclosing the coil so as to heat the chamber surfaces (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Hama et al. modified by Aruga and Yin et al. so as to include a heater in the segregation wall part because such a heater will allow better controllability of the process being conducted within the apparatus.

Response to Arguments

Applicant's arguments filed 12/1/05 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in

the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine the Hama et al. and Aruga references is clearly stated above, for example, to protect the quartz from the effects of a corrosive plasma, such as a halogen containing plasma. Concerning the fact that Aruga does not suggest coating a segregation wall separating a plasma generation chamber and process chamber, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Regarding element 18 of Hama being considered to be a plasma generation chamber, the examiner respectfully submits that fig. 1 of Hama makes clear that considering element 18 to be a plasma generation chamber is proper and therefore the rejection is maintained.

Applicant also argues that Li does not disclose a segregation part separating an etch chamber and a plasma generation chamber including a heater. However, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Concerning the combination of references used to reject claim 5 and their motivation, suitability for an intended purpose is an adequate motivation to combine references and therefore this rejection is proper.

Conclusion


Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Luz L. Alejandro
Primary Examiner
Art Unit 1763

February 21, 2006